

R005-36

Zoom meeting C : 11/2 AM2 (10:45-12:30)
12:15-12:30

O/Xモード分離のイオノグラムを用いた電離圏パラメータ自動抽出手法の改善

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Improvement of automatic scaling technique of ionospheric parameters using O/X separated ionograms

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National Institute of Information and Communications Technology (NICT) has been observing ionosphere by ionosondes for over 70 years in Japan in order to monitor ionospheric conditions. Currently, four ionosonde systems are routinely operated at four stations at Wakkanai (Sarobetsu, Hokkaido), Kokubunji (Tokyo), Yamagawa (Kagoshima), Okinawa (Ogimi, Okinawa). Automatic scaling of an ionogram, which is a diagram of time-of-flight against transmitted frequency, is one of the important techniques for real-time monitoring. The automatic scaling technique has been developed and implemented since the late 1980s. It has developed through trials and errors, however, the complexity of the ionospheric echoes which both Ordinary mode (O-mode) and Extra-ordinary mode (X-mode) exist makes it difficult to scale them properly. In 2016-2017, we replaced our ionosonde system with a new system, Vertical Incidence Pulsed Ionospheric Radar 2 (VIPIR2) ionosonde. One of the advantages of VIPIR2 is a receiving antenna array, which makes it possible to separate O-mode from X-mode by utilizing in-phase and quadrature data. The O/X mode separated ionograms are used for automatic scaling with artificial intelligence (AI) technique. The AI model is trained using manually scaled data and the corresponding ionograms for four stations. The method was validated with one-year foF2 data in 2018 for four stations. The scaling accuracy is improved from 80.0% to 99.8%. The successful rate of scaling is also improved from 0.26MHz to 0.12MHz for foF2. The new auto-scaling method is applied from Jan. 2020. The auto-scaled parameters are provided through our web site in real-time: http://wdc.nict.go.jp/IONO/HP2009/ISDJ/auto_txt.html. In presentation, we will overview the new automatic scaling procedure and give some example which is now possible to detect automatically using the new automatic scaling tool.